

WHAT IS CLAIMED IS:

1. An apparatus for loading fibers in a fiber suspension with calcium carbonate, comprising:

a housing having an inlet and an accept outlet;

a rotatable distribution member positioned within said housing;

5 a rotor and stator assembly positioned within said housing radially outside of said distribution member;

a toothed ring interposed between said distribution member and said rotor and stator assembly, said toothed ring and said rotor and stator assembly defining a gas ring therebetween; and

10 a reactant gas supply fluidly coupled with said gas ring.

2. The fiber loading apparatus of claim 1, further including a rotatable input shaft, each of said distribution member and said rotor being coupled with and driven by said input shaft.

3. The fiber loading apparatus of claim 2, each of said distribution member and said rotor being generally concentric with said input shaft.

4. The fiber loading apparatus of claim 1, said distribution member comprising a distribution cross with a plurality of radially extending paddles.

5. The fiber loading apparatus of claim 1, said inlet comprising an inlet pipe and said distribution member positioned generally concentric with said inlet pipe.

6. The fiber loading apparatus of claim 1, said distribution member having an axis of rotation, and said toothed ring being annular shaped with a plurality of teeth extending generally parallel to said axis of rotation and annularly spaced apart from each other.

7. The fiber loading apparatus of claim 6, said teeth having a generally rectangular cross-sectional shape.

8. The fiber loading apparatus of claim 1, said reactant gas supply coupled with said housing and in fluid communication with said gas ring at a plurality of locations.

9. The fiber loading apparatus of claim 8, including a control valve coupled with said reactant gas supply for controlling at least one of a pressure and flow rate of carbon dioxide into said gas ring.

10. The fiber loading apparatus of claim 1, said housing including two annular shaped walls, said stator and said toothed ring coupled with one of said walls, and said rotor positioned adjacent an other of said walls.

11. The fiber loading apparatus of claim 1, said reactant gas supply comprising a carbon dioxide gas supply.

12. An apparatus for loading fibers in a fiber suspension with calcium carbonate, comprising:

a housing having an inlet and an accept outlet;

a rotatable distribution cross within said housing, said distribution cross including four

5 radially extending paddles, said distribution cross having an axis of rotation;

a rotor and stator assembly positioned within said housing radially outside of said distribution cross;

a toothed ring interposed between said distribution rotor and said rotor and stator assembly, said toothed ring having a plurality of teeth extending generally parallel to said axis of
10 rotation and spaced apart from each other, said toothed ring and said rotor and stator assembly defining a gas ring therebetween; and

a reactant gas supply fluidly coupled with said gas ring.

13. The fiber loading apparatus of claim 12, further including a rotatable input shaft, each of said distribution member and said rotor being coupled with and driven by said input shaft.

14. The fiber loading apparatus of claim 13, said distribution member comprising a distribution cross including at least 2 to 8 radially extending paddles, each of said distribution cross and said rotor being generally concentric with said input shaft.

15. The fiber loading apparatus of claim 12, said inlet comprising an inlet pipe and said distribution member positioned generally concentric with said inlet pipe.

16. The fiber loading apparatus of claim 12, said distribution member having an axis of rotation, and said toothed ring being annular shaped with a plurality of teeth extending generally parallel to said axis of rotation and spaced apart from each other.

17. The fiber loading apparatus of claim 16, said teeth having a generally rectangular cross-sectional shape.

18. The fiber loading apparatus of claim 12, said reactant gas supply coupled with said housing and in fluid communication with said gas ring at a plurality of locations.

19. The fiber loading apparatus of claim 18, including a control valve coupled with said carbon dioxide supply for controlling at least one of a pressure and flow rate of carbon dioxide into said gas ring.

20. The fiber loading apparatus of claim 12, said housing including two annular shaped walls, said stator and said toothed ring coupled with one of said walls, and said rotor positioned adjacent an other of said walls.

21. The fiber loading apparatus of claim 12, said reactant gas supply comprising a carbon dioxide gas supply.